

TITLE:

NETWORK TRAFFIC BASED ADAPTIVE POWER MANAGEMENT SYSTEM FOR COMPUTER NETWORKS

ABSTRACT:

A method for power management and energy conservation in computer networking equipment uses the information on network traffic intensity. The cooling and ventilation provided is directly proportional to network traffic intensity. The traffic intensity information is conveyed to the power management processor, which uses pulse width modulation (PWM) to control cooling and ventilation fans in the equipment. Traffic intensity is proportional to the switching activity in integrated circuits. Switching activity in integrated circuits is proportional to the heat generation in integrated circuits. Higher traffic intensity results in higher heat generation, which correspondingly results in higher cooling and ventilation requirements. The cooling and ventilation should adapt dynamically to the requirements of the system. This adaptation and optimal application of cooling and ventilation in networking equipment provides reduction in power usage in the system equipment. The function of power management processor can be outside of the existing integrated circuits electronics or alternatively can be designed within one of the existing integrated circuits. Control of cooling and ventilation system will also provide reduction in noise levels within the networking equipment facility. This power management invention can also be applied to Storage Area Network (SAN) networking equipment and wireless networking equipment, which is part of the network computing system. The invention can also be deployed in a heterogeneous network comprising of a combination of wired networking, storage area network, and wireless network.